

The King County Energy Plan

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Table of contents

I.	Introduction and Executive Summary	2
II.	Energy Task Force	7
III.	Goals and Actions	8
	Goal No. 1: King County will be a leader in the use of climate friendly, renewable energy sources and will achieve the goals of the Renewable Energy Order.	8
	Goal No. 2: King County will maximize the conversion of waste-to-energy.....	10
	Goal No. 3: King County will be a leader in energy efficiency by achieving a 10 percent normalized net reduction in county energy use by 2012.....	12
	Appendix A: Executive Order: Renewable Energy and Related Economic Development.....	22
	Appendix B: 2007 King County Energy Use Baseline	25

I. Introduction and Executive Summary

King County is committed to being a leader in renewable energy and environmental stewardship. Now, as the impacts of climate change and dependence on foreign oil heighten the need for action, the county is increasing its efforts to combat these problems and to become a catalyst for a sustainable energy future. This Energy Plan builds on King County's existing efforts and sets the stage for even greater strides towards energy efficiency and renewable energy use in county internal operations.

King County Executive Ron Sims issued an Executive Order in March of 2006 which establishes future renewable energy use requirements for King County government operations and directs the development of an energy plan to meet those requirements and address other energy goals. A copy of the Renewable Energy Order is attached as Appendix A. The Renewable Energy Order requires that:

- 50 percent of King County's non-transit energy use come from renewable sources by 2012
- 35 percent of King County's transit energy use come from efficiencies and renewable sources by 2015
- 50 percent of King County's transit energy use come from efficiencies and renewable sources by 2020

Further support for these efforts was demonstrated by the Metropolitan King County Council in adopting Motion 2006-0328, which required an Energy Plan to be developed and delivered to the council by February 1, 2007.

The need for the Renewable Energy Order and King County's increased efforts to use and promote renewable energy is apparent. The use of fossil fuels results in air pollution and contributes to global warming. Global warming will have significant adverse impacts on our environment, health and economy.

In addition, the supply of traditional fossil fuels is rapidly diminishing and continued dependence on these fuels may be economically devastating and perpetuates our reliance on foreign oil. Use of clean, renewable energy reduces the level of fossil fuel emissions, reduces dependence on foreign oil and promotes new and environmentally-friendly economic development.

This Energy Plan sets an initial roadmap for achieving the mandates of the Renewable Energy Order and planning for King County's future use, generation and conservation of energy. This Energy Plan is built around three main goals:

1. *King County will be a leader in the use of climate friendly, renewable energy sources and will achieve the goals of the Renewable Energy Order.*
2. *King County will maximize the conversion of waste-to-energy.*

3. *King County will be a leader in energy efficiency by achieving a 10 percent normalized¹ net reduction in county energy use by 2012.*

Actions outlined in this plan will move the county forward towards achieving each of these goals.

To date, county-wide internal “waste-to-energy” projects have focused primarily on wastewater treatment facilities. These projects have produced energy equivalent to as much as 11 percent of the county’s total energy use from renewable resources.

In the future, Cedar Hills Landfill will provide the county’s greatest single opportunity to turn waste into energy. Current projections are that the landfill will remain open until 2016, providing for methane extraction well into the late 2020’s. An award-winning methane capture system is in place and provides for maximum capture of all methane gas emitted by decaying garbage. Several engineering estimates place the gas output of Cedar Hills at greater than 2 Trillion British Thermal Units (BTUs) of gas per year for 20 years, which will be cleaned of impurities for sale as pipeline quality gas. The combustion products from burning this landfill gas do not add to greenhouse gasses, because the carbon does not come from fossil sources. When the Cedar Hills waste-to-energy project is developed, the gas production from it will be equivalent to more than 50 percent of all current energy use by the county. As currently envisioned, greenhouse gas offset credits created from displacement of fossil natural gas with Cedar Hills biogenic gas will be retained by the county when the gas is sold. Some of these offsets may be used to help the county meet its renewable energy goals.

Historically, wastewater treatment facilities have been a primary focus of renewable and efficiency efforts in the county, because these facilities are far more energy intensive than other county facilities; more than 60 percent of the total energy used by county government in stationary facilities is for wastewater treatment. In the 1960’s, the West Point Wastewater Treatment Plant was constructed with influent pumps that were powered by methane gas derived from treating wastewater. Since this initial effort, King County has been actively engaged in pursuing similar waste-to-energy projects, as well as the application of other renewable energy technologies.

In 1985, three cogeneration units were installed at West Point to further maximize waste-to-energy and reduce the need to flare methane gas. The combined heat and power cogeneration, along with the gas-driven influent pumps, provided for nearly 50 percent of the plant’s total electricity needs from a renewable resource. Additionally, nearly 100 percent of the digester gas was being converted to energy. However, due to the age of the cogeneration units, they needed to be shut down. Plans are now under way to replace the existing cogeneration units with new, more efficient units, or alternatives which will increase the waste-to-energy output as much as practical.

¹ *Normalization of energy use is common practice in conservation, to remove confounding factors in energy accounting. The ETF will agree on appropriate normalization factors for various energy end uses and functions. Normalization is intended to reveal actual energy use reductions under varying conditions, but should not diminish or slow progress toward the goal of reducing net county energy use.*

King County's leadership in new energy technology continued in 2004 when the county brought the nation's largest single-unit methane gas fuel cell online at the South Wastewater Treatment Plant. The fuel cell, rated at one megawatt (MW) production, was operated as a demonstration project whose costs were shared by King County, FuelCell Energy, and the Environmental Protection Agency (EPA). This project concluded in 2006, successfully demonstrating that fuel cells can operate efficiently on digester gasses.

Two gas turbines and one steam turbine were installed at the South Plant in 2005 in a flexible combined-cycle configuration. These units can operate on scrubbed digester gas produced by sewage, or on natural gas supplied by the utility. Electric power generation facilities at South Plant can provide most of the plant's power needs under normal conditions, if needed. In addition, South Plant is able to sell scrubbed gas to Puget Sound Energy for pipeline distribution. The choice of biogas application is based on plant needs and energy market prices.

The Brightwater Treatment Plant, currently under construction and projected to begin operation in 2010, provides new opportunities for renewable energy development. An energy plan for the plant itself has already been initiated and alternative sources for power are being explored, including an energy "test bed" that will be a laboratory for proof-of-concept testing of new renewable energy technologies.

In addition to waste-to-energy projects, the county has been implementing projects to conserve energy and resources for many years. Since 2000, 58 major projects have been completed in partnership with Seattle City Light and Puget Sound Energy (PSE) conservation programs. Together, these projects are saving an estimated 24,857,405 kilowatt hours (kWh) of electricity, 8,925 therms of gas, and costs of \$1.75 million annually. Most of the projects qualified for utility funding, and King County has received grant payments totaling over \$1.9 million.

King County has led by example in building construction. Under King County Ordinance 16147, adopted in July 2008, Leadership in Energy and Environmental Design (LEED) Gold certification is required for new construction and major remodels, where economically feasible, to maximize efficiency and minimize environmental impact. LEED certification provides guidelines for ensuring efficiencies are installed during construction. By reducing energy use, construction of expensive new generation can be avoided.

A progressive conservation program addressing all resources has recently been initiated in partnership with Puget Sound Energy. In March 2005, King County and PSE signed an agreement that would look at all King County facilities to reduce energy and resource usage. In August 2005, a resource conservation manager was hired to implement this program. The goal of this program is to achieve an overall normalized resource reduction of 10 percent within the next five years. Achieving this goal will save the county in excess of 1 million dollars annually. In short, King County will achieve compliance with the Renewable Energy Order's requirement that 50 percent of King County's non-transit

energy come from or be offset by renewable energy sources by 2012 by increasing energy efficiency, maximizing the conversion of waste-to-energy (particularly at Cedar Hills Landfill), and purchasing renewable energy if appropriate.

Another goal of the Executive Order is that 35 percent of transit energy use comes from efficiencies and renewable sources by 2015, and 50 percent by 2020. DOT's Transit division plans to meet these goals include expanded hybrid electric bus use, hybrid electric support vehicles, synthetic oils, synthetic lubricants, biodiesel when cost effective, ethanol and extended oil drain intervals with conventional oils.

Fleet Administration has established a strategic environmental business plan to implement purchase of hybrid vehicles and renewable fuel vehicles. Fleet Administration will expand the purchase of hybrid vehicles in all segments of its fleet and is purchasing flex fuel vehicles so as to make a smooth transition to ethanol when it becomes more accessible and affordable.

King County has one of the largest publicly owned fleets of hybrid electric vehicles (HEVs) in the region. Since 2001, these vehicles have been in use across King County departments and in the daily rental motor pool dispatch. Fleet Administration has already documented significant reduction in fuel consumption from the 136 HEVs that it now operates. These HEVs represent 32 percent of the cars in the fleet. The potential savings to be realized on fuel costs, from the 105 Toyota Priuses and 31 Ford Escapes, range from 30 percent to 50 percent depending on the model. The county will save an average of 20 tons of carbon dioxide (CO₂) per Prius, and 27 tons of CO₂ per Escape. This amounts to approximately 2,937 tons of CO₂ emissions saved over the lifespan of these vehicles when compared to conventional vehicle counterparts.

King County, led by Fleet Administration, is also committed to participation in a collaborative field test of Plug-in Hybrid Electric Vehicles (PHEVs) in partnership with the U.S. Department of Energy's Idaho National Laboratories, the City of Seattle, the Port of Seattle and Puget Sound Clean Air Agency (PSCAA). PHEVs are advanced "pre-commercial" hybrids that operate almost exclusively on electricity in their normal operating range, but have internal combustion engines to provide backup power when the batteries run low. In 2008, 12 vehicles will be road tested in Seattle to establish their performance under fleet operating conditions

Fleet Administration has, as part of its strategic response to climate change, committed to the acquisition of hybrid trucks and purchased the first three medium duty hybrid trucks in 2007. The data show that under certain applications, hybrid trucks can save up to 60 percent in fuel over conventional diesel-powered utility trucks.

Fleet Administration formed a regional consortium to encourage other local governments to participate in the acceleration of the medium and heavy duty hybrid truck market. Fleet has also applied for, and received; grant funding to help offset the incremental higher purchase price for hybrid trucks. Fleet Administration will continue to seek other third-party funding to help offset the high incremental cost of hybrid trucks.

Another strategic initiative is to reduce the amount of energy lost through unnecessary idling. The data indicate that a typical truck burns one gallon of diesel fuel for each hour it idles and as little as 10 seconds of idle time reduces fuel efficiency and produces unnecessary pollutants. King County's Anti-Idling Policy – FES 12-5 (AEP – which took effect in January 2007), has the potential to save up to 6 percent in fuel per year.

All of these projects and the action items set out in the Energy plan bring tremendous benefits to King County and its citizens, including significant reductions in greenhouse gas emissions. As a result of these efforts, King County will also reduce its dependence on purchased energy and resources, and insulate itself from market price volatility when possible. These efforts, coupled with the actions set forth in this plan, lay the groundwork for King County to meet its renewable energy goals.

To measure progress towards these goals, all county energy purchases, production, and usage will be converted to the standard unit of energy measurement the British Thermal Unit, or BTU. This will allow for universal tracking and accounting of the various energy forms utilized throughout county operations.

II. Energy Task Force

A countywide task force convened to carry out this plan and ensure a consistent and continued focus on energy efficiency and use of renewable energy resources. This task force is constituted of representatives from the departments of Executive Services (DES), Natural Resources and Parks (DNRP) Transportation (DOT) and others when appropriate. The Directors of each of the departments will provide executive sponsorship to the task force. The Energy Task Force (ETF) will:

- a. Monitor compliance with this plan and the Renewable Energy Order;
- b. Recommend additional strategies as necessary to achieve compliance with the Renewable Energy Order;
- c. Adopt work plans to study and increase renewable energy use;
- d. Coordinate intra-county efforts regarding energy issues;
- e. Advise the Executive on energy matters and recommend new energy initiatives;
- f. Develop and monitor the implementation of energy efficiency and conservation benchmarks and efforts within county facilities and operations;
- g. Monitor energy policy, development and supply markets for their effect on present and future energy costs;
- h. Develop partnership arrangements with other local jurisdictions and/or private businesses as appropriate to improve energy use and acquisition strategies, reducing waste and costs while improving energy market positions; and
- i. The Renewable Energy Order also requires that the departments of Natural Resources and Parks and Transportation provide the Executive with annual reports regarding energy use. The ETF will be responsible for the review of those reports prior to submittal to the Executive.

III. Goals and Actions

Goal No. 1: King County will be a leader in the use of climate friendly, renewable energy sources and will achieve the goals of the Renewable Energy Order.

Actions:

1. *Increase use of renewable fuel and efficiency of county buses and vehicles.*

a. Hybrid-electric buses

King County is a nationally acclaimed leader in the use of hybrid-electric bus technology, and the county will continue to purchase and use hybrid-electric buses. Data developed by the National Renewable Energy Laboratory indicates that hybrid-electric buses are 30 percent more fuel-efficient than conventional diesel buses on the same routes operating in similar service. Metro Transit operates 236 hybrid-electric buses, or 16 percent of the fleet. Operating costs are estimated to be 15 percent lower than a conventional diesel bus.

b. Efficient vehicles

Vehicles other than those used to convey transit passengers will be reviewed in four areas to maximize fuel efficiencies. First, the physical size of support vehicles will be reduced with the intent of improving fuel economy and overall operating cost. Second, the county will review the retail market to seek vehicles that use 85 percent ethanol (E-85) and will strategically apply those vehicles in our fleet. Third, all diesel vehicles will use biodiesel (at least B-20, 20 percent biodiesel). Over the next several years, as diesel engines become more available in smaller vehicles, King County will seek opportunities to apply them in the fleet. They offer the opportunity of extremely low emissions and superior fuel economy. Fourth, the county will purchase hybrid cars and trucks, as funding is available and the applications meet our business needs.

c. Reduce engine oil use

Engine oil drain intervals provide a new opportunity for reducing the impacts of engine oil used in buses. This is particularly evident with engines in hybrid vehicles which operate much cooler than conventional diesel buses. The testing and data collection is not complete in this area but early indications are very promising for reducing mineral based engine oil. The second part of this effort is to validate the technical application and cost effectiveness of synthetic engine oil. This work is also in progress. In order to minimize the use of fossil fuels, Fleet Administration and Transit have been using re-refined lubricating oil in all of its vehicles since 1995. In 2000, Fleet Administration began using used motor oil to heat its maintenance facility.

2. *Maximize cost effective use of solar energy at county facilities.*

Solar energy is a proven approach to renewable energy generation. Although in the Pacific Northwest sunlight is more limited than in many US regions, some solar projects can already be cost-effective in King County, especially with newer incentives. To date, the county's solar energy installations have included security lighting on bus shelters, supplemental lighting of roads and partial power at solid waste transfer stations. Solar energy will continue to be regularly evaluated county-wide for use in new construction, retrofit construction and in specific applications.

3. *King County will transition to purchasing electricity produced from renewable sources, either from the local utilities that currently serve county facilities or other providers.*

County departments responsible for electricity purchasing will seek to make this transition as resources become available in the market and on a schedule that takes into consideration the cost, available funding and public benefit associated with such purchases. King County's purchase will not only increase its use of renewable energy but will also further stimulate the market to increase the availability of renewable power. A detailed plan for this transition will be completed by the ETF.

4. *The county will seek to foster broader use and development of clean, renewable fuel technologies through energy demonstration projects that include biodiesel, hydrogen, or other developing technologies.*

The Energy Task Force is charged with adopting a work plan to guide the aggressive study and implementation of renewable energy demonstration projects. King County is already home to one of the world's largest fuel cell demonstration projects. New and innovative technology will continue to evolve, and King County will play a significant role in acting as a living laboratory for such technology.

King County will seek partnerships with other public and private organizations to test and utilize new and evolving energy technologies. King County can partner with organizations such as Pacific Northwest Laboratories or the Washington Technology Center to develop new energy technologies. Through the living laboratory concept, King County can continue to provide leadership in implementing new energy technologies. King County will strive to meet the challenge of future demand through economical, state-of-the-art technology.

Goal No. 2: King County will maximize the conversion of waste-to-energy.

Actions:

1. *Convert to energy 100 percent of all reasonably usable waste products at landfills and wastewater treatment plants by 2012.*

- a. Landfill gas project

King County is developing a landfill gas project at the Cedar Hills Regional Landfill to exploit the renewable energy resource there. The landfill provides the county's greatest opportunity to turn waste into energy. Decomposing waste at the landfill produces methane gas, which is a potent greenhouse gas. The county works diligently to capture this gas and avoid its release into the atmosphere, currently burning it in flares. Once it's collected, methane gas can be better used if it is scrubbed and used in place of fossil pipeline natural gas or used to generate electricity.

The landfill should continue to receive solid waste until at least 2016, and methane gas is expected to be extracted well into the late 2020's. An award-winning methane capture system is in place at Cedar Hills that captures 85% percent of the gas emitted by decaying garbage. The county has secured an agreement with a developer to "scrub" (remove contaminants) from the landfill gas to produce a salable pipeline-quality natural gas product, which is carbon-neutral and a 'renewable resource' because of its bio-genic source. The pipeline gas produced will be sold, while retaining the environmental credits associated with its renewable energy source status for the county's use. It is predicted that the pipeline quality gas output of the Cedar Hills landfill gas project will exceed 426 million therms of "green gas" in 20 years, generating revenues for King County estimated at more than \$20 Million over this period for the gas sales alone; not considering any possible market value for GHG offset or renewable energy credits associated with this gas. If used in an on-site generating plant this amount of landfill gas could produce approximately 25 average megawatts of electricity.

- b. One of the world's largest fuel cell projects

In 2006, King County completed a pilot project with the nation's largest biogas-powered fuel cell at the South Wastewater Treatment plant in Renton. The fuel cell extracted hydrogen from natural gas, scrubbed digester gas, or unscrubbed digester gases. Each of these three forms of fuel were demonstrated to be viable feedstocks for the one megawatt fuel cell. A grant from the U.S. Environmental Protection Agency, and partnership arrangements with Fuel Cell Energy and King County made this project possible. Following completion, analysis will be conducted to determine the future use of the cell and possible acquisition of other fuel cell technologies.

- c. Increase energy generated at wastewater facilities

The South Wastewater Treatment Plant is positioned to respond to a number of market conditions. With rising natural gas prices, digester gas can be scrubbed and

sold to the local utility at a competitive price, based on the weighted average cost of natural gas. Or the plant can choose to use the scrubbed digester gas for generating heat and power via the cogeneration units. Purchased natural gas is only used as a backup for cogeneration if sufficient scrubbed digester gas is not available and/or there is a rationale to generate electricity or reduce demand on the electric power system with utility gas. South Plant may well be the first wastewater treatment facility in the nation capable of partially insulating itself from rising or falling natural gas and electricity prices while utilizing renewable energy from methane gas.

King County will explore ways to further increase the energy generated from waste at wastewater facilities. Potential exists for increasing energy production by increasing digester output through the direct acceptance of food waste and/or agricultural wastes at wastewater treatment facilities. The Wastewater Treatment Division will study the viability of such applications.

2. *Develop rural biomass energy projects*

King County is pursuing a unique biomass project on the Enumclaw Plateau, a rural area that features the county's largest concentration of dairy farms. The project will seek to process manure from dairy cattle through anaerobic digesters to remove nutrients that impact local water quality, while converting the byproducts into energy. The county will partner with researchers and farmers to design and implement a successful project.

3. *Conduct studies to identify other commercial and industrial wastes that could be converted to energy and plan for county facilitation of waste-to-energy projects.*

King County departments will create work plans to identify and evaluate other waste-to-energy opportunities, as appropriate, seeking innovative ways to utilize King County's existing infrastructure or new facilities to exploit the energy in current waste streams, where cost/benefit ratios support these actions. The Task Force will evaluate these efforts and provide guidance. Progress on these efforts will be included in the annual renewable energy report that DNRP is to file with the Executive, in accordance with the Renewable Energy Order.

Goal No 3: King County will be a leader in energy efficiency by achieving a 10 percent normalized net reduction in county energy use by 2012.

The ETF established 2007 as the county-wide energy use baseline year and is adopting standards for calculating annual reductions in energy use. To accommodate changes in occupancy, square footage and substantial changes in facility function as well as yearly weather variations, the Task Force will evaluate, incorporate and update appropriate data normalizations and annual adjustments to the initial baseline on an ongoing basis, while progressing toward the 2012 goal of reducing energy use in county operations by 10 percent.

Actions:

- 1. Implement a countywide comprehensive utility accounting management strategy to achieve best management practices for energy use, billing services and cost savings.*

King County has implemented a consolidated countywide database of utility costs and consumption. The database software, Utility Manager, is the workhorse accounting system of the county's energy and resource conservation management program. This database is used to establish baselines and quantify savings, allowing the county to consolidate and benchmark energy and resource consumption data for its buildings. Such detailed energy tracking is essential for King County to actively and strategically manage energy consumption. With this action, the county has and will:

- Compiled a master list of all county utility accounts, meters, services and rates;
- Enabled identification of billing discrepancies and facilitate tracking credits;
- Established facility baselines and goals and provide regular feedback to departments on program progress;
- Identified consumption anomalies that may relate to operational issues such as leaks or failed controllers;
- Tracked consumption patterns to verify the success of implemented savings programs; and
- Made accurate use projections to help create budgets and forecasts.

As part of this effort, division energy focused staff, finance managers and accounts payable personnel are being trained on the system as well as the process of utility bill auditing to identify billing errors, dormant and non-county accounts, and opportunities to save money through rate changes. The Department of Natural Resources and Parks (DNRP) technology unit will house and maintain the Utility Manager software system. The DNRP energy group will be responsible for training county staff on the system and for establishing utility accounting and bill auditing procedures to ensure consistent and accurate data. Cost savings achieved through these activities will be tracked and reported annually to demonstrate the added value of utility accounting and bill auditing.

2. *Develop an accurate baseline of energy use for the entire county's operations in order to measure progress toward the 10 percent reduction goal.*

In the designated baseline year, 2007, King County used approximately 3.45 trillion BTUs of energy, with major uses broken down as follows:

- Approximately 668,022 million BTUs were used in buildings or other facilities where floor space is the primary meaningful metric. With an estimated 5.5 million square feet of facility space, this equates to a county-wide average Energy Use Index (EUI) for buildings of 121 thousand BTUs per square foot per year. This figure intentionally excludes several divisions/units (Transit, Wastewater, Solid Waste, Fleet, Public Health and the Sheriff's Office) where the energy use was not predominately in buildings.
- A subset of the buildings counted above is managed by Facilities Management division, comprising approximately 3.3 million square feet of floor space. Annual energy use in these buildings in 2007 was 313,926 million BTUs. This equates to an average EUI of 95 thousand BTUs per square foot per year.
- In accepting and processing the county's wastewater, DNRP's Wastewater division used approximately 780,142 million BTU in 2007, while processing 64,902 million gallons per year (MG). This equates to an energy intensity of 12 BTU/Gal.
- Managing disposal of King County solid waste, DNRP's Solid Waste division consumed 181,691 million BTU while processing 1,010,429 tons of solid waste. This equates to an energy intensity of 89.8 BTU/lb of solid waste processed.
- In the Department of Transportation divisions where rolling stock energy use predominated, the following energy intensities were reported:
 - In Transit division, a total of 1,808,071 million BTUs of energy were used (204,897 million BTU being from biodiesel) to serve 110,600,190 riders, equating to an energy intensity of 16,348 BTU/ride.
 - In Fleet Administration division's vehicles, used by all King County staff, a total of 206,161 million BTU of liquid fuels were used (8,125 million BTU from biodiesel) in 18,412,965 million vehicle miles, equating to an energy intensity of 11,196 BTU per mile.
 - Road Services used 34,062 million BTU of energy in 2007, of which 33,193 MMBTU (97%) was green power purchased from Puget Sound Energy. This energy was used primarily in buildings and road lighting systems of various kinds. Road Services equivalent EUI based on square feet of floor area was 146 thousand BTUs per square foot per year.
 - King County Airport used 27,766 million BTU of energy in 2007, largely in buildings; the Airport division's EUI was 61 thousand BTUs per square foot per year.

Tabular format details of the 2007 energy use baseline are in Appendix B and available in electronic format from DRNP's Energy Group.

3. *Departments and divisions will set targets to achieve energy savings, using the agreed on baseline energy use and normalizations appropriate to their service functions.*

Achieving our goal to reduce King County energy use 10 percent by 2012 will require an average reduction of 68,978 MMBTU per year over the county as a whole each year through 2012. These savings will be achieved by the county government divisions. Again considering the largest:

- In FMD facilities, a 10 percent reduction will correspond to reducing the average EUI in their buildings by 1.9 kBTU per square foot per year, or reducing division use by an estimated average 6,279 MMBTU each year through 2012.
 - In the Department of Natural Resources and Parks' Wastewater division, a 10 percent reduction will require lowering their EUI by 0.24 BTU/Gal per year, or reducing division use by a total of 15,603 MMBTU per year through 2012
 - In DNRP's Solid Waste Division, a 10 percent reduction will require lowering SWD's EUI by 1.8 BTU/lb of waste processed per year, or a division reduction of 3,634 MMBTU per year through 2012.
 - Department of Transportation Transit Division rolling stock energy reduction goals, although more complex because of likely substitution of services and multiple fuels and energy sources, should overall be approximately 327 BTU per ride per year or a total division reduction of 36,161 MMBTU per year for the 5 years through 2012.
 - A 10 percent reduction in DOT's Fleets division's use can be achieved by improving their fleet energy efficiency by approximately 224 BTU per mile per year, or an average division fuel energy use reduction of 4,123 MMBTU per year through 2012.
4. *Adopt mandatory energy efficiency and resource use guidelines for operation and maintenance of all county occupied facilities. Unique operating requirements of specialty facilities will be addressed in separate facility plans, as outlined in action item 4.*

To help achieve a standard level of efficiency in its buildings, the King County Energy Task Force will establish general operating guidelines for county occupied facilities by Dec 31st, 2008. Maintenance and operations sections will be expected to implement and monitor the guidelines applicable to building heating, ventilating and air-conditioning (HVAC) and other technical hardware. All county staff and visitors will be expected to follow the guidelines relating to daily operation of building resources.

The energy and resource use guidelines will address heating and cooling set points, building HVAC schedules, lighting expectations, plug load management including

computer power management settings, operation of office equipment, and use of personal appliances. The guidelines will also address water conservation and waste reduction and recycling expectations. For buildings with unique operating requirements, such as detention facilities, the guidelines may be modified to accommodate their special conditions, subject to approval by the ETF.

5. *Create an initiative to encourage employees to implement energy conserving measures at work.*

People who occupy, operate, and maintain our buildings play a significant role in how much energy and resources a facility consumes. Each day, we all make decisions that impact the bottom line. For example: all building users are capable of turning lights off in unoccupied rooms. Building operators make decisions about system set points. And maintenance insures that systems run efficiently. Companies can spend thousands of dollars on efficient equipment, but if the whole building community is not aware of their role in maintaining efficiency and minimizing waste, building performance can soar well above projected levels. By educating and motivating people to use resources wisely, we can reduce waste and generate savings.

The King County energy awareness campaign will seek to fundamentally change the energy and resource consuming behavior of all 15,000 county employees. By actively engaging staff to make daily decisions to reduce resource consumption, the county can achieve significant cost savings and environmental mitigation. Behavior modification has been shown to generate up to 10 percent reduction in resource use from a typical building baseline. Eliminating waste through operational changes is a low-cost no-cost strategy that should be implemented with priority.

This campaign will aim to empower employees to help manage energy and resource consumption by:

- Providing information and technical assistance on efficient operation of building resources to help employees evaluate their daily practices for efficiency;
 - Creating and maintaining a designated web site and e-mail address (conserve.energy@kingcounty.gov) to allow for feedback and distribution of information;
 - Developing and executing a program to train selected lead staff best practices for resource use efficiency and conservation in county operations
 - Developing a program for monitoring efforts and regular distribution of reports;
 - Creating user incentives for aggressive resource and energy reduction; and
 - Promoting successful building and/or departmental efforts through awards, case studies and contests.
6. *Develop specific energy management plans for each energy-intensive and/or special-purpose county facility, such as the West Point and South wastewater treatment plants, the King County Correctional Facility, and transit bases as well as Cedar Hills Landfill and future solid waste processing facilities. These plans will focus on*

least-cost management and include specific approaches for each facility's use, production and sale of energy.

As the energy market has developed and fluctuated over the last several years, the county's wastewater treatment plants and landfill have developed the capability to not only capture and reuse digester gas for on-site energy needs, but also to arbitrage the value of their energy resources against market prices, displacing purchase and/or selling energy as appropriate.

We now have multiple viable choices for energy demand side management, supply and in some cases, sale. The challenge is to ensure that our operational choices reflect the most economical and environmentally sustainable decisions for King County. We must take into account overall costs and benefits of each system when determining how we will operate our energy generation resources.

In addition to wastewater treatment, the county provides several other large public purpose facilities such as jails, police precincts, and transit bases. These types of facilities, while not consuming as much energy as our wastewater treatment plants, also require careful attention to their operating considerations in order to meet their mandates in the most efficient manner practical. The specialized mission of these facilities warrants specific building operating guidelines that consider unique process or facility requirements.

The ETF will identify facilities requiring specialized energy management plans. The task force will work with key staff at these locations to identify operating parameters and best practices to be incorporated in the plan. Special purpose facility energy management plans will be completed no later than December 2008.

7. *Conduct and/or update efficiency audits of all significant county buildings by 2010 and create a prioritized action plan for reducing energy use at each building.*

By inventorying our facilities' equipment and systems, along with operational characteristics, we can identify cost-effective opportunities to improve efficiencies and reduce waste. These efforts will be completed in several phases and will consist of both an operational component (OCM) and an equipment upgrade component (ECM). Operational audits will be ongoing, whereas equipment upgrade audits will be phased based on complexity.

- a. Operational Assessments

Operational and maintenance (O&M) assessments focus on no-cost, low-cost opportunities to optimize the performance of existing systems. These audits include analyzing historical energy data for trends, performing daytime and nighttime walk-throughs as appropriate, and analyzing set points, control strategies, and equipment performance in relationship to system design and occupancy needs in order to identify opportunities to reduce operating costs and/or environmental footprint.

Building O&M audits will be prioritized based on building EUI (energy use per square foot adjusted for weather). Buildings with the highest EUIs will be audited first. Initial walk-through audits will be conducted to identify obvious operating issues and general system conditions. Inconsistencies relevant to the county operating guidelines (action item 2) will be noted, along with additional recommendations to increase system efficiencies through operational changes. Operational issues relating to county guidelines will be forwarded to the relevant party to be acted upon immediately. Items identified might include resetting HVAC start and stop times, changing the temperature range between heating and cooling set points, or on and off times for exterior lights, etc. These control settings should align with the energy and resource use guidelines as described in action 2.

After walk-through audits have been completed, findings and a list of specific recommendations will be compiled and presented to facility managers, technicians and operators. Together, this group will then prepare a facility action plan to identify clear and specific actions that need to be taken and a timeframe for how and when issues will be addressed.

If considerable operational issues exist, retro-commissioning may be considered. Retro-commissioning is a detailed, systematic process for investigating an existing building's energy systems operations, identifying ways to improve performance, modifying the systems and ensuring that performance is achieved. If the walk-through audit notes major operational and comfort issues, retro-commissioning could be considered as the first line of attack to increase a building's energy efficiency. A commissioning agent (either in-house or independent) will be employed and the local utility will be contacted for assistance.

Department (and Division, where applicable) energy teams, under guidance from the ETF will prepare work plans and procedures for the O&M audit process including desired general outcomes. Efforts will be made to quantify and verify savings generated from the O&M audit process. Energy management system trend logging, independent metering, and utility interval data will be used for this task.

b. Equipment Assessment

Traditional energy audits focus on investigating existing building systems for opportunities to replace equipment in order to save energy. Over the years, many of our buildings may have been audited for equipment upgrades through local utility programs or other contracted services. Initially, building documentation will be reviewed for past energy audits. Buildings that have had an energy audit within the last three years, and buildings that have been constructed within the same period, will be considered current for equipment upgrades. It is anticipated

that any equipment upgrade projects that have occurred as a result of these audits will be accounted for in the current ECM project inventory.

The first priority for new building audits will be the 10 largest users (total energy) and the 10 buildings with the highest energy use per square foot (EUI). Walk-through audits will be conducted in these facilities to identify existing equipment, obvious equipment upgrades and general system conditions. In terms of equipment upgrades, a walk-through may identify potential efficiency improvements to lighting, controls, or motors. At this phase, a simple list of each action item can be generated to serve as a placeholder until further analysis can be done.

Once a general list of equipment upgrades has been compiled for a building, each department has the option of further developing this list with consultants and/or utility assistance or an Energy Services Company should be enlisted via the General Administration (GA) Energy Savings Performance Contract (ESPC) to further analyze the cost and savings potential of the projects. Equipment Conservation Measures (ECMs) will be prioritized and may be implemented via the revolving fund described under strategy 6.

Upon completion of the first set of buildings, the auditing process will continue with the next top 10 facilities until all facilities have been audited.

8. *The Energy Task Force (ETF) shall define threshold performance criteria for energy efficiency and renewable energy projects which qualify them as cost effective. The ETF will seek Executive and Departments' commitments to non-competitively approve and secure funding for such projects as identified through audits, on the basis that they are sound financial investments. Criteria-qualified renewable energy projects will receive priority consideration in budget processes.*

Technology is constantly changing. As new products enter the market place, it often makes economical sense to upgrade equipment to save energy and resources. These projects can take the form of no-cost or low-cost, in-house jobs, or, more likely, larger projects executed as part of the capital improvement program. In either case, utility rebates and grant partnerships should be pursued and total investment, cost savings, and environmental benefit will be tracked.

King County has been implementing projects to conserve energy and resources for many years. However, there has never been a unified effort to plan and execute resource conservation efforts strategically as a county, and to compile information on the results of projects, reporting the overall benefit to the county. The new strategy will employ common methods and tools supporting a consistent, coordinated approach to efficiency upgrades so that we can capture more of the potential resource and more easily account for resource savings from capital improvements and quantify income from utility grants and rebates.

All energy-use affecting projects will be implemented in coordination with the ETF or its assignee. Projects will be assigned a tracking number and standard data will be collected for county reporting. Forms for recording necessary information will be developed under direction of the ETF. Verified annual savings from completed projects will then be captured from departmental utility budgets and reallocated to a specified budget location to be used to implement future ECM projects.

9. *Aggressively pursue utility grant funding and energy services contracts to supplement county monies for energy efficiency efforts.*

Ever since the oil embargo and consequent energy crisis in the 1970's, utility companies have been involved in implementing conservation projects as a recognized means of avoiding building new generation. Oftentimes these programs include grant incentives for design, materials, and installation of equipment that will save energy or other resources. For obvious reasons, it is in the best interest of the county to take advantage of these programs and partner with local utilities whenever possible. Under our current capital improvement procedures, however, there is no mechanism in place to ensure this.

To begin the process of organizing information, the county will adopt a standard energy and resource balance sheet requirement for all capital improvement projects. This form will indicate the overall impact to energy or resources as a result of the project or modification. Not only will collecting this information allow us to begin the collective process of evaluating ECM funding, it will also help us to forecast expenditures, establish budgets and facilitate the county benchmarking required by the new executive orders.

The ETF will approve a project form for energy and utility impact with input from the departments. Projects that are expected to result in utility savings will be forwarded to the relevant utility company for their review and analysis. Individual project managers will be expected to follow the utility grant program application process through to close out. Copies of approved grants and rebates and payments from utilities should be forwarded to the ETF for record keeping. The ETF will prepare a flowchart and hold trainings to assist project managers, as required, in this effort.

10. *Benchmark all applicable county buildings using the ENERGY STAR benchmarking tool. Apply for LEED Existing Building (LEED EB) and/or ENERGY STAR certification on all qualifying existing county buildings.*

The EPA has developed a nation-wide energy performance rating system called ENERGY STAR. This tool allows users to enter building specific information into a national database which then rates the building's performance on a scale of 1-100 relative to similar buildings nationwide. The rating system accounts for the impacts of year-to-year weather variations, as well as building size, location, and several operating characteristics. Buildings that rate 75 or greater may qualify for the ENERGY STAR label.

Building types that are eligible for this rating system are:

- Offices (general offices, financial centers, bank branches, and courthouses)
- K-12 schools
- Hospitals (acute care and children's)
- Hotels and motels
- Medical offices
- Supermarkets
- Residence halls and dormitories
- Warehouses (refrigerated and non-refrigerated)

Due to the unique nature of King County operations, only 35 out of 345 (10 percent) county-owned facilities potentially fall into these categories. For those buildings that do qualify, efforts will be made to utilize this national system of benchmarking. Furthermore, due to the nature of our facilities, only a small percentage of the 35 eligible buildings may additionally qualify for LEED-EB certification. The LEED Green Building Rating System® is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. LEED-EB provides a recognized, performance-based benchmark for building owners and operators to measure operations, improvements and maintenance on a consistent scale.

While a majority of our facilities will not be eligible for recognition under these national rating systems, King County's goal is to reduce county energy consumption by 10 percent, which will be an effort worth recognition once achieved. With this goal in mind, King County will investigate the requirements for recognition under the ENERGY STAR leadership program.

11. Achieve LEED Gold certification on all new county construction as defined in King County Ordinance 16147.

Washington State has had a progressive energy code for many years. King County has committed to building above those codes to achieve higher LEED standards. Innovative design can often be received with skepticism, so it is important to demonstrate performance through measurement and verification. By quantifying and verifying the amount of resource savings that result from King County's efforts to exceed model code efficiencies, we can help demonstrate the value added by this program.

As a part of the requirements set forth in Ordinance 16147, King County will develop a system to track and report energy and resource savings that result from our green-building efforts. The baseline for resource savings will be the Washington State Non-Residential Energy Code or the Seattle Energy Code, whichever is applicable, and other local codes related to a building's resources consumption. As a goal, all new construction and major remodel projects should exceed code by a minimum of 20 percent. In addition to resource savings, efforts shall be made to determine incremental costs for each above-code element.

In addition to rebates for energy efficiency improvements in existing buildings, utility companies often offer grants for new construction where design substantially exceeds local codes. Utilities should be approached to partner with the county on efforts to increase efficiencies in new buildings and to secure grant funding where available. By requiring the quantification of energy and resource savings against local codes, the supporting documentation required for participation in these programs will be readily available.

12. Encourage purchase of ENERGY STAR-labeled appliances and equipment (or equally efficient alternatives) and require consideration of energy efficiency in all procurement decisions as element of determining lowest priced bids.

ENERGY STAR products meet strict energy efficiency criteria as set by the EPA or the U.S. Department of Energy. These energy efficient products save money and help protect the environment by causing fewer harmful emissions from power plants. Some examples of product specifications are:

- Qualified refrigerators are at least 15 percent more efficient than the minimum federal efficiency standard.
- Qualified TVs consume three watts or less when switched off, compared to a standard TV, which consumes almost six watts on average.
- Office equipment that qualifies automatically enters a low-power "sleep" mode after a period of inactivity.

13. Allow a portion of energy cost savings to be retained by applicable county departments as incentive for achieving energy efficiency.

King County will seek to establish a formal process to recognize and reward county departments for successful conservation programs. Utility savings generated from efforts will be calculated and a portion of the savings will be returned to the departments that generated the savings.

Conserving energy and water and reducing waste can potentially generate revenue for the county through reduced operating costs. By quantifying and reinvesting this money into our departments, the county can encourage energy and resource management, reward departments for their efforts, present departments with additional opportunities to reinvest monies in their operations and facilities, provide building occupants with a goal to work towards, and demonstrate the county's support for resource conservation

The ETF will develop a proposal for a shared savings program.

Appendix A: Renewable Energy Order

Executive Order: Renewable Energy and Related Economic Development

Document Code No.: PUT 7-6 (AEO)

Department/Issuing Agency: Executive Office

Effective Date: April 1, 2006

Approved: /s/ Ron Sims

Type of Action: New

This Order requires that at least 50 percent of King County's total non-transit energy use come from renewable energy sources by the year 2012, that at least 35 percent of transit energy use come from efficiencies and renewable energy sources by the year 2015, and that at least 50 percent of transit energy use come from efficiencies and renewable energy sources by the year 2020.

WHEREAS, this Order sets a renewable energy standard that will put King County at the forefront of renewable energy use and will be a market catalyst to help move the region and the nation towards a clean energy economy; and,

WHEREAS, supply of traditional fossil fuels is rapidly diminishing and continued dependence on traditional fossil fuels will be economically devastating and is a threat to our national security; and,

WHEREAS, use of traditional fossil fuels results in air pollution and is a primary cause of global warming and climate change; and,

WHEREAS, global warming will have significant adverse impacts on our environment, health and economy; and,

WHEREAS, use of clean, renewable energy reduces the level of fossil fuel emissions that are a main cause of global warming; and,

WHEREAS, use of clean, renewable energy provides a primary resource for self-sustaining counties; and,

WHEREAS, improved transit technology and best practices by Metro Transit Operators and Vehicle Maintenance Section employees contribute to efficiencies that reduce non-renewable energy consumption and reduce greenhouse gas emissions; and,

WHEREAS, use of clean, renewable energy reduces our dependence on sources of foreign oil – strengthening our economy and promoting national security; and,

WHEREAS, use of clean, renewable energy promotes new and environmentally-friendly economic development; and,

WHEREAS, use of renewable energy can be made in a cost-effective manner; and,

WHEREAS, King County has set a goal to use biodiesel across 20 percent of its buses and vehicles, making it the largest single user of biodiesel in Washington State and significantly helping to stimulate the region's biodiesel market; and,

WHEREAS, King County has demonstrated a first-of-its-kind stationary application of hydrogen fuel cell technology run on methane gas from its South Treatment Plant; and,

WHEREAS, King County has demonstrated the significant potential for waste-to-energy conversion at its Cedar Hills landfill; and,

WHEREAS, King County has joined with education, energy and business groups such as Friends of the Hidden River, the Northwest Energy Technology Collaborative, Snohomish County Public Utility District and Snohomish County Economic Development Council in designing an energy technology education center at its Brightwater Treatment Plant that aims to educate the public on innovative energy technologies that can be applied in wastewater treatment; and,

WHEREAS, King County is entrusted with protecting its citizens, the environment and economy and will be a leader in the use of renewable energy;

NOW, THEREFORE, I Ron Sims, King County Executive do hereby order and direct:

(1) This Order requires that at least 50 percent of King County's total non-transit energy use come from renewable energy sources by the year 2012, that at least 35 percent of transit energy use come from efficiencies and renewable energy sources by the year 2015, and that at least 50 percent of transit energy use come from efficiencies and renewable energy sources by the year 2020.

(2) To achieve compliance with this Order, the following Actions, among others that will be developed over time, will be taken:

a) The county will seek to maximize the conversion and use of waste for energy. The Department of Natural Resources and Parks (DNRP) will seek to convert and use all reasonably usable waste at wastewater treatment facilities and the Cedar Hills Landfill to energy. DNRP will also analyze other opportunities to use county or third party wastes to generate energy.

b) The county will transition to purchasing electricity produced from renewable sources either from the local utilities serving county facilities or other providers. County departments responsible for electricity purchasing are directed to make this transition as such resources become available and on a schedule that takes into consideration the cost, available funding and public benefit associated with such purchases.

c) The county will continue the use of biodiesel in county buses and other county vehicles and will seek to increase the amount of biodiesel used. In addition, the county will seek to use other alternative fuels and hybrid vehicles as technology and funding allows.

d) The county will implement a program to minimize existing energy use through increased efficiency, optimized operation and maintenance, and conservation efforts.

(3) A detailed approach to carrying out these Actions and achieving compliance with this Order will be include in a King County Energy Plan, which is to be completed by the Department of Natural Resources and Parks (DNRP) by January 1, 2007. The Energy Plan will also include other energy objectives and the necessary actions for achieving those objectives.

(4) The Energy Plan is to be consistent with the county's global warming policy and is to be completed in coordination with the Executive, the Department of Transportation (DOT) and the Facility Management Division of the Department of Executive Services (FMD). The Energy Plan will be updated at least every five years to ensure that the county is taking appropriate steps to achieve compliance with this Order and meet the other objectives of the Energy Plan.

(5) DOT will be responsible for developing the portion of the Energy Plan relating to county vehicle and bus fuel use. In addition, DOT will continuously analyze new fuel and technology developments in order to prepare for the eventual transition to a fleet of county vehicles and buses powered solely by renewable energy sources.

(6) DNRP is directed to monitor the county's overall compliance with this Order. DNRP will issue an annual Renewable Energy Use Report to the Executive detailing total county energy usage measured in British Thermal Units (BTUs) and the total percentage of such energy that is from renewable energy sources. The Report will also advise the Executive of the planning and measures being undertaken to increase the county's use of renewable energy. DOT will provide the portion of this annual report that addresses trends and developments in renewable energy sources and the potential use of such sources to power county buses and vehicles.

(7) For purposes of this Order, "energy" includes electricity, vehicle fuel, oil, natural gas, steam and other fuel purchased for the function of heating, cooling, lighting, and mechanical motion. "Renewable energy sources" includes solar, wind, water, geothermal, refuse-derived fuels, and other sources that can be replenished naturally or biologically. "Renewable energy" means energy derived from renewable energy sources.

DATED this 22nd day of March 2006.

Ron Sims, King County Executive (Original Signed)

ATTEST: (original signed)

James J. Buck, Interim Director
Records, Elections and Licensing Services Division

Appendix B: 2007 King County Energy Use Baseline

(Available in Excel spreadsheet format with additional detail)

Non - Renewable Energy Use										
2007 Totals w/o Renewables		Electrical MMBTU	Natural Gas MMBTU	Steam MMBTU	Propane MMBTU	Heating Oil MMBTU	Gasoline MMBTU	Diesel MMBTU	Jet Fuel MMBTU	2007 Non renewableM MBTU
DNRP	Parks & Recreation Division	18,760	24,983	0	0	513	0	0	0	44,256
	Solid Waste Division	26,463	0	0	0	2,222	4,332	135,913	0	168,930
	Water & Land Resources Division	5,803	6,775	0	0	0	0	0	0	12,578
	Wastewater Treatment Division	516,390	24,764	0	6,681	0	90	33,103	0	581,027
	DNRP Subtotal	567,416	56,523	0	6,681	2,734	4,422	169,016	0	806,792
DOT	Fleet Administration	778	1,400	0	0	0	155,168	40,690	0	198,036
	King County Airport	17,865	6,618	0	0	0	2,568	715	0	27,766
	Road Services	0	869	0	0	0	0	0	0	869
	Metro Transit	161,243	74,191	25	0	0	91,280	1,276,435	0	1,603,174
	DOT Subtotal	179,886	83,077	25	0	0	249,016	1,317,840	0	1,829,845
FMD	Adult & Juvenile Detention	80,681	46,954	44,531	0	0	0	0	0	172,166
	Community and Human Services	1,348	1,309	0	0	0	0	0	0	2,656
	Executive Services	2,572	3,269	0	0	0	0	0	0	5,841
	General Office Administration	53,269	3,793	3,128	0	0	0	0	0	60,189
	Judicial Administration	37,624	1,907	33,543	0	0	0	0	0	73,074
	DES Subtotal	175,493	57,231	81,202	0	0	0	0	0	313,926
	Public Health	8,839	3,518	0	0	0	6,569	0	0	18,927
	Sheriff's Office	7,557	4,606	0	0	0	6,720	448	2,009	21,340
	Subtotal	16,397	8,124	0	0	0	13,289	448	2,009	40,266
TOTAL		939,192	204,954	81,227	6,681	2,734	266,727	1,487,547	2,009	2,990,829
Transit Use alone		161,243	74,191	25	0	0	91,280	1,276,435	0	1,603,174
Everything BUT Transit		777,949	130,763	81,202	6,681	2,734	175,447	211,112	2,009	1,387,655

Renewable Energy, Total Energy and Percentages												
2007 Totals with Renewables and percent renewables		Renewable Electric Power MMBTU	Biogas (Digester and Landfill) MMBTU (4)	BioDiesel MMBTU	Total Renewable MMBTU	Total Energy Use MMBTU including Renewables	Percent Renewables	Normalization Basis	Normalization Units	2007 Normalized Total Energy use	Normalized Energy Units	Percent of County Energy Use
DNRP	Parks & Recreation Division	0	0	0	0	44,256	0%	227,250	Sq-ft	195	Kbtu/sq-ft	1%
	Solid Waste Division	0	0	12,761	12,761	181,691	7%	1,010,429	Tons SW	89.9	Btu/lb	5%
	Water & Land Resources Division	0	0	0	0	12,578	0%	23,000	Sq-ft	547	Kbtu/sq-ft**	0%
	Wastewater Treatment Division	0	196,502	2,613	199,114	780,142	26%	64,902	Million Gal	12	Btu/gal	23%
	DNRP Subtotal	0	196,502	15,373	211,875	1,018,666	21%	N/A				30%
DOT	Fleet Administration	0	0	8,125	8,125	206,161	4%	18,412,965	Vehicle-miles	11,196	Btu/mile	6%
	King County Airport	0	0	0	0	27,766	0%	451,761	Sq-ft	61	Kbtu/sq-ft	1%
	Road Services	33,193	0	0	33,193	34,062	97%	233,814	Sq-ft	146	Kbtu/sq-ft**	1%
	Metro Transit	0	0	204,897	204,897	1,808,071	11%	110,600,190	Riders	16,348	Btu/ride	52%
	DOT Subtotal	33,193	0	213,022	246,215	2,076,060	12%	N/A				60%
FMD	Adult & Juvenile Detention	0	0	0	0	172,166	0%	1,166,686	Sq-Ft	148	Kbtu/sq-ft	5%
	Community and Human Services	0	0	0	0	2,656	0%	68,276	Sq-Ft	39	Kbtu/sq-ft	0%
	Executive Services	0	0	0	0	5,841	0%	84,450	Sq-Ft	69	Kbtu/sq-ft	0%
	General Office Administration	0	0	0	0	60,189	0%	1,309,552	Sq-Ft	46	Kbtu/sq-ft	2%
	Judicial Administration	0	0	0	0	73,074	0%	667,635	Sq-Ft	109	Kbtu/sq-ft	2%
	DES Subtotal	0	0	0	0	313,926	0%		Sq-Ft			9%
	Public Health	0	0	0	0	18,927	0%	130,399	Sq-Ft	145	Kbtu/sq-ft**	1%
	Sheriff's Office	0	0	0	0	21,340	0%	88,198	Sq-Ft	242	Kbtu/sq-ft**	1%
	Subtotal	0	0	0	0	40,266	0%		N/A			1%
TOTAL		33,193	196,502	228,395	458,090	3,448,919	13%	N/A	N/A	N/A	N/A	100%
Transit Use alone		0	0	204,897	204,897	1,808,071	11%					52%
Everything BUT Transit		33,193	196,502	23,498	253,193	1,640,847	15%					48%

Notes:

1 Gasoline totals for Fleets include personal vehicles used for County business.

2 Known account omissions exist, primarily in Parks and Roads, for electric utility data. These are relatively small scale and will be added when received from the utilities.

3 In some cases there may be multiple or different normalizations for different sites / energy supplies - add these disaggregations as needed, keeping as simple as practical

4 Biogas counted in this inventory is only that which is effectively employed to displace other "non renewable" fuels

5 Biodiesel reported gallons are from CCX reporting by Matt Kuharic, 05/2008

6 Energy content of biodiesel is assumed: 131,496 Btu/Gal Per Todd Ellis of Imperium Renewables 206.254.0207 (6/4/08)

7 ** Energy Intensity (EI) values for WLRD, Roads, Public Health and Sheriff's Office are problematic. Is sqft the measure of service?. Consider alternate normalization

ENERGY PRIMARY USES	
In or Dominated by Buildings & Stationary Facilities	
In Waste Handling & Treatment	
In or Dominated by Rolling Stock Fuels	
Mixed Facilities / Rolling Stock Energy	